




# **SERVICE MANUAL FOR**

<b>LS-2220</b>	<b>LS-2150</b>
<b>LS-2720</b>	<b>LS-2125i</b>
<b>LS-2820</b>	<b>LS-2125b</b>
<b>LS-2920</b>	<b>SL-7</b>
<b>LS-2320</b>	<b>JS-23</b>
<b>LS-2725</b>	<b>VX-1435</b>
<b>LS-2825</b>	<b>X-5</b>
<b>LS-1520</b>	<b>LX-3125</b>
<b>LS-2020</b>	<b>LS-3125</b>
<b>LS-2125</b>	<b>LS-3000</b>
<b>LS-2129</b>	<b>LS-5000</b>
<b>LS-2130</b>	

## ● GENERAL INFORMATION ●

- This service manual was compiled for use when repairing the LS-2220, 2720 Zigzag Stitch Sewing Machines.
- Use this manual, together with the Parts Catalog, when making repairs.
- This manual was written based on the most up-to-date product specifications at the time of printing. Some machine specifications may have been changed to improve the quality of the product. Contact the manufacturer or your local sales representative for information on such changes.

- Symbols used

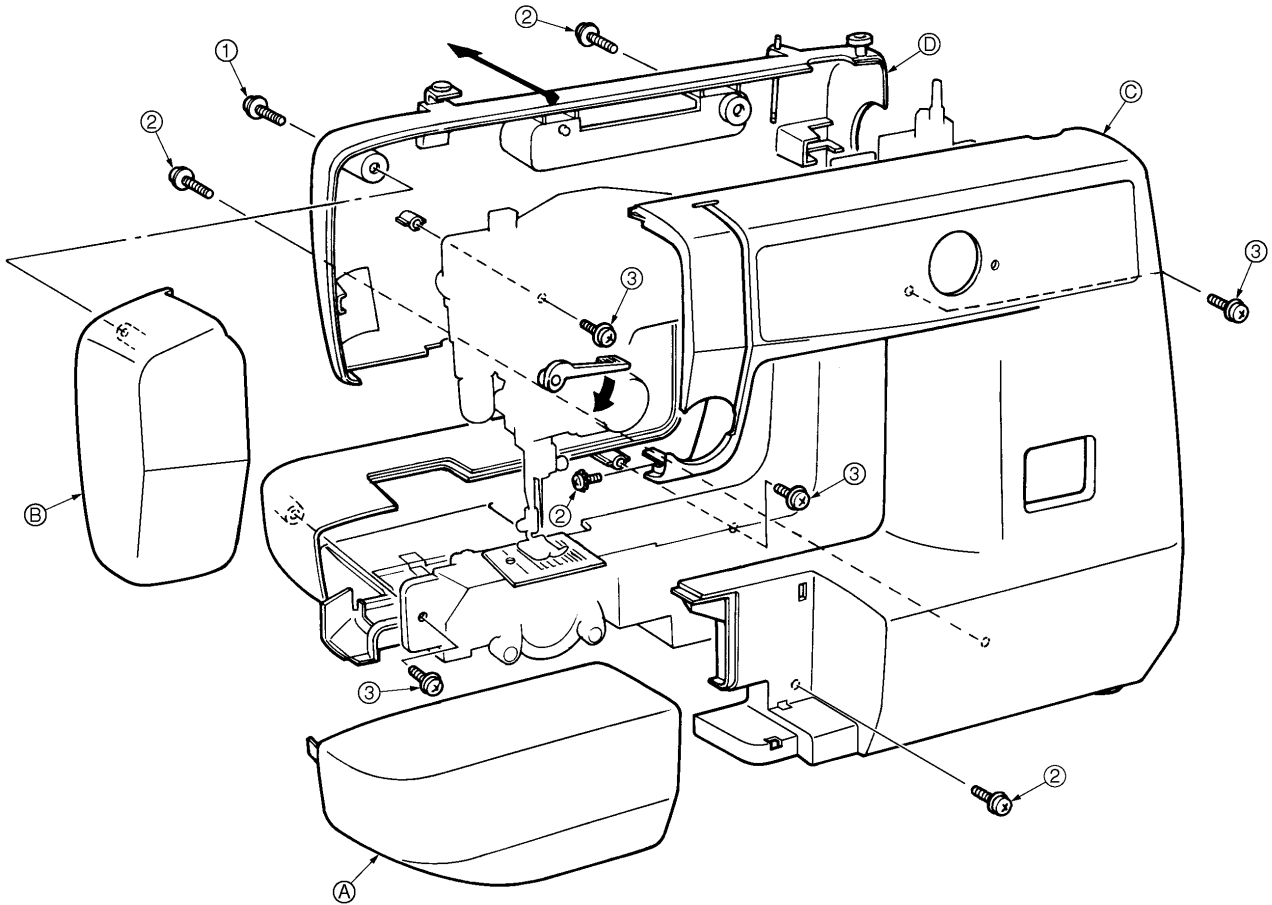
	Move the part in the direction of the arrow.
	Set the clearance as indicated.
	Move the part to its highest or lowest position.



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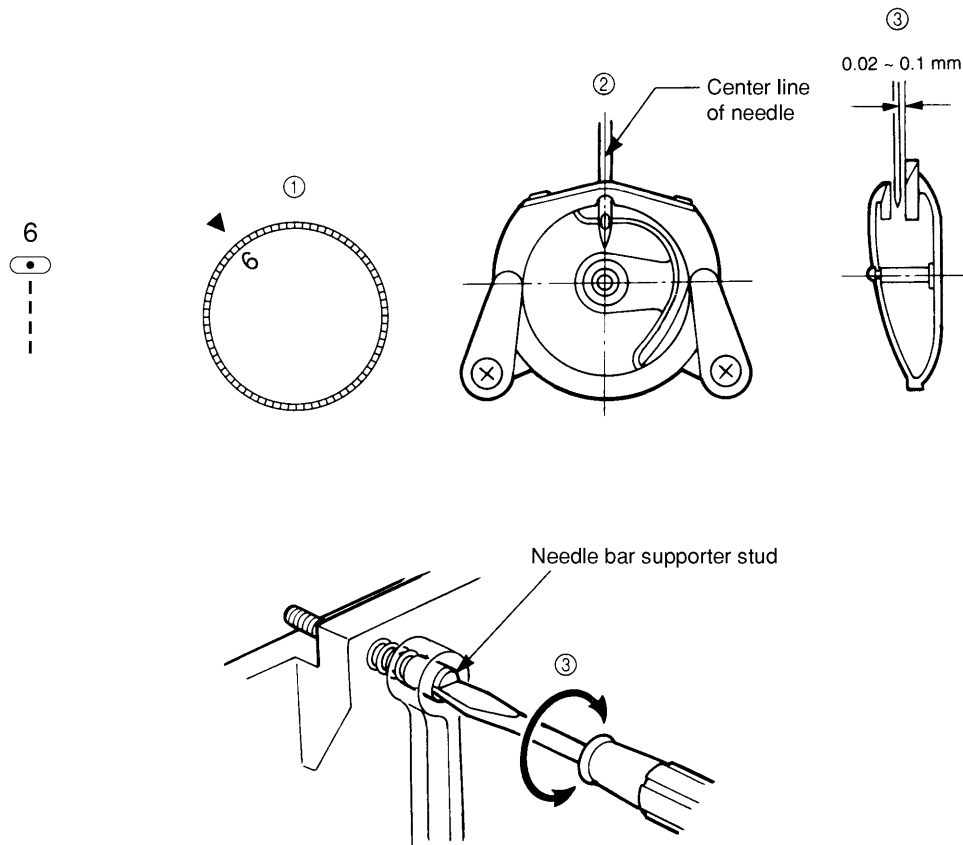
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## Removing order of covers



- Remove accessory table (A).
- Loosen and remove the screw ❶ then remove the face plate (B).
- Loosen and remove the screws ❷ then remove the front cover (C).
- Loosen and remove the screws ❸ lower the presser foot lifter, then remove the rear cover (D).

## Clearance between the needle and the shuttle hook point (Shuttle race position)



### Standard

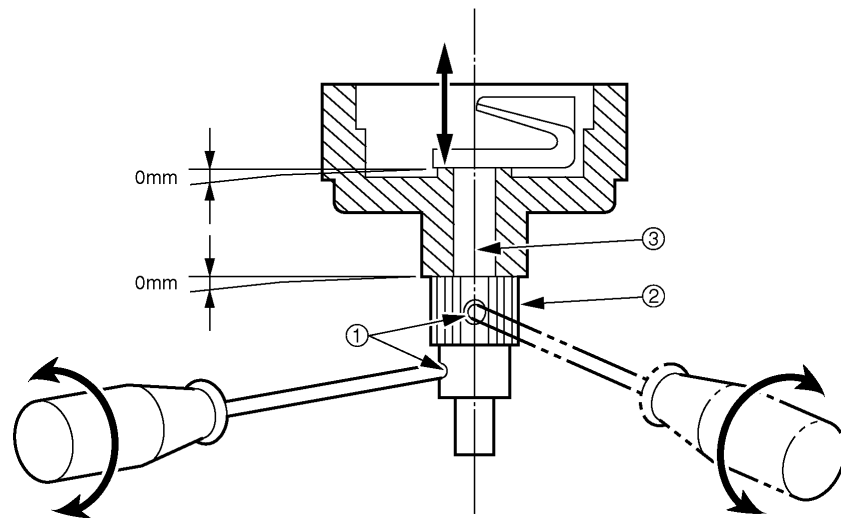
- The shuttle race should be positioned correctly with respect to the turning direction of the shuttle race..
- Clearance between the needle and the shuttle hook point should be 0.02 to 0.1mm.

### Adjustment

- Set the pattern selection dial to 6 ❶.
- Turn the balance wheel to set the needle and the shuttle hook to the correct timing position ❷.
- Turn the needle bar supporter stud ❸ slightly to either the right or left and adjust the clearance between the needle and the shuttle hook.

Note: The center of the needle should align with the center of the shuttle hook shaft.

## Clearance between the shuttle driver and the race way



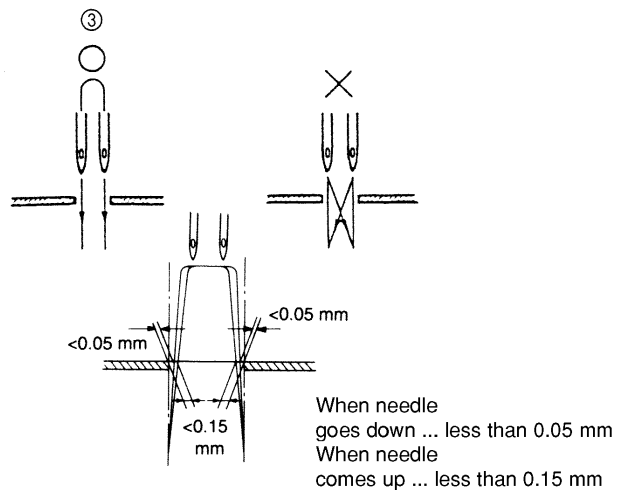
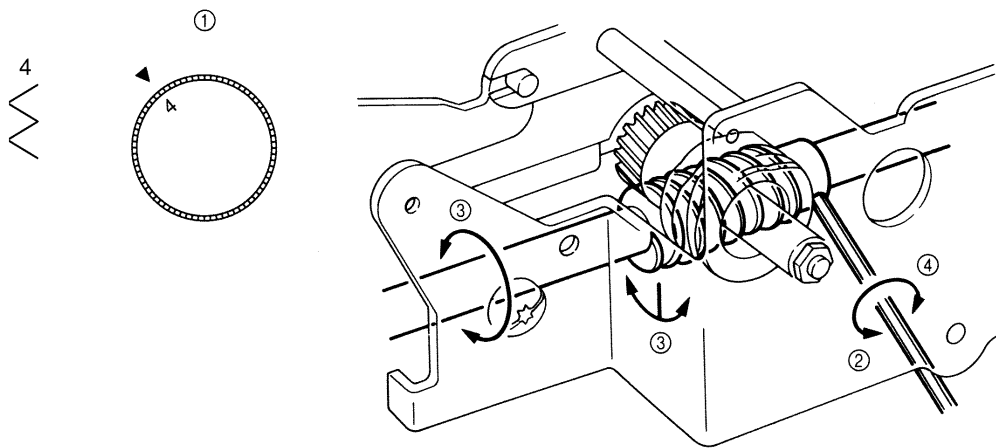
### Standard

- The shuttle driver should rotate smoothly, no play should be felt in the race way.

### Adjustment

1. Loosen setscrews ❶ of the driver shaft gear ❷.
2. Adjust the clearance of the driver shaft ❸.
3. Retighten the setscrews ❶.

## Needle swing (Parabola)



### Standard

When the pattern selection dial is set at 4 (Zigzag), the needle swing should be 0.05 mm or less while the needle moves down from the needle plate to its lowest position. While the needle moves up from its lowest position to the needle plate, the needle swing should be 0.15 mm or less. These clearances should be on both sides of the needle plate hole.

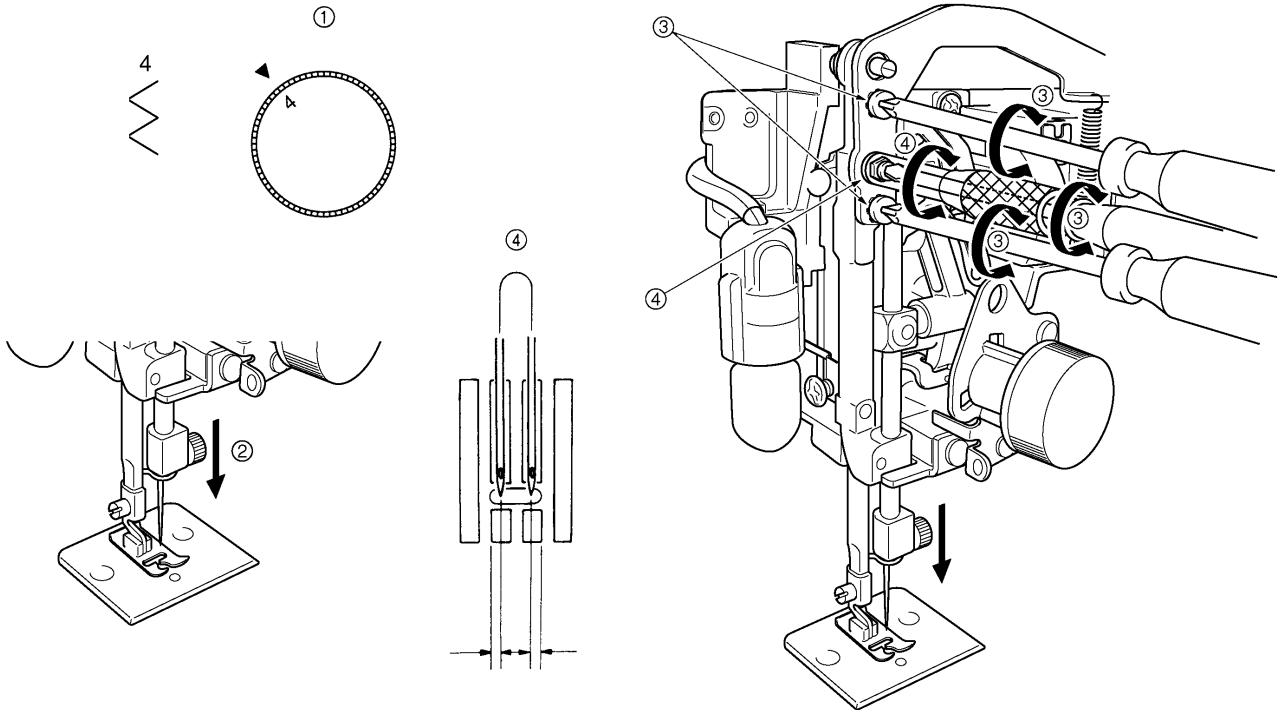
### Adjustment

1. Set the pattern selection dial to 4 (Zigzag).
2. Loosen the three set screws on the worm gear.
3. Turn the worm gear to adjust the needle swing.
4. Tighten the three set screws on the worm gear.

Note: Make sure that the biting worm gear aligns with the pattern cam gear.




## Needle down centering



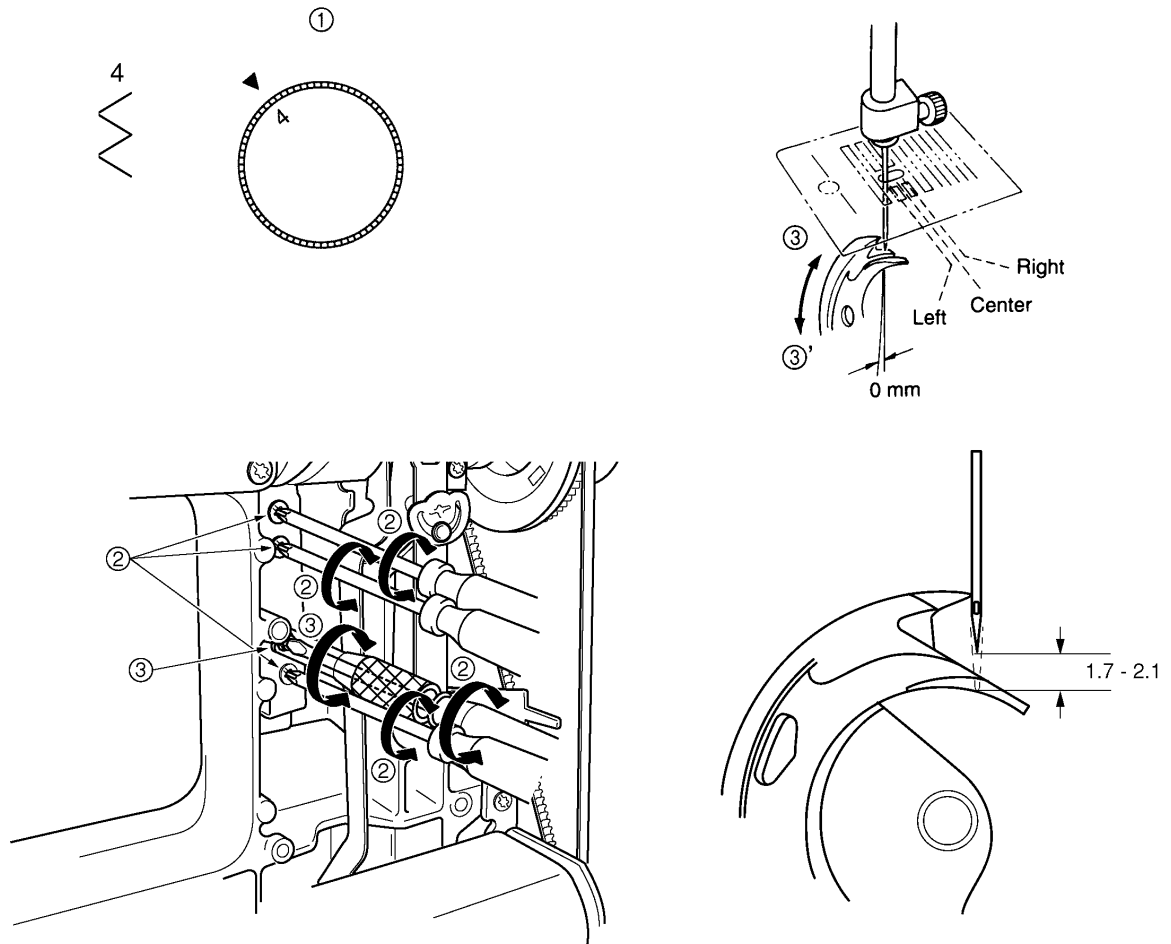
### Standard

- When the pattern selection dial is set at 4 (Zigzag), the needle should move within a range of 5.0 to 5.4 mm across the needle plate. When the needle is lowered, it should not be too close to either the left or right edge of the needle plate hole.

### Adjustment

1. Set the pattern selection dial to 4.
2. Turn the balance wheel to lower the needle until it is just above the needle plate.
3. Loosen the locknut for the adjusting screw on the zigzag connecting rod.
4. Using a screwdriver, turn the screw and adjust the needle movement range with respect to the needle plate hole.
5. Tighten the locknut .


# Loop lift



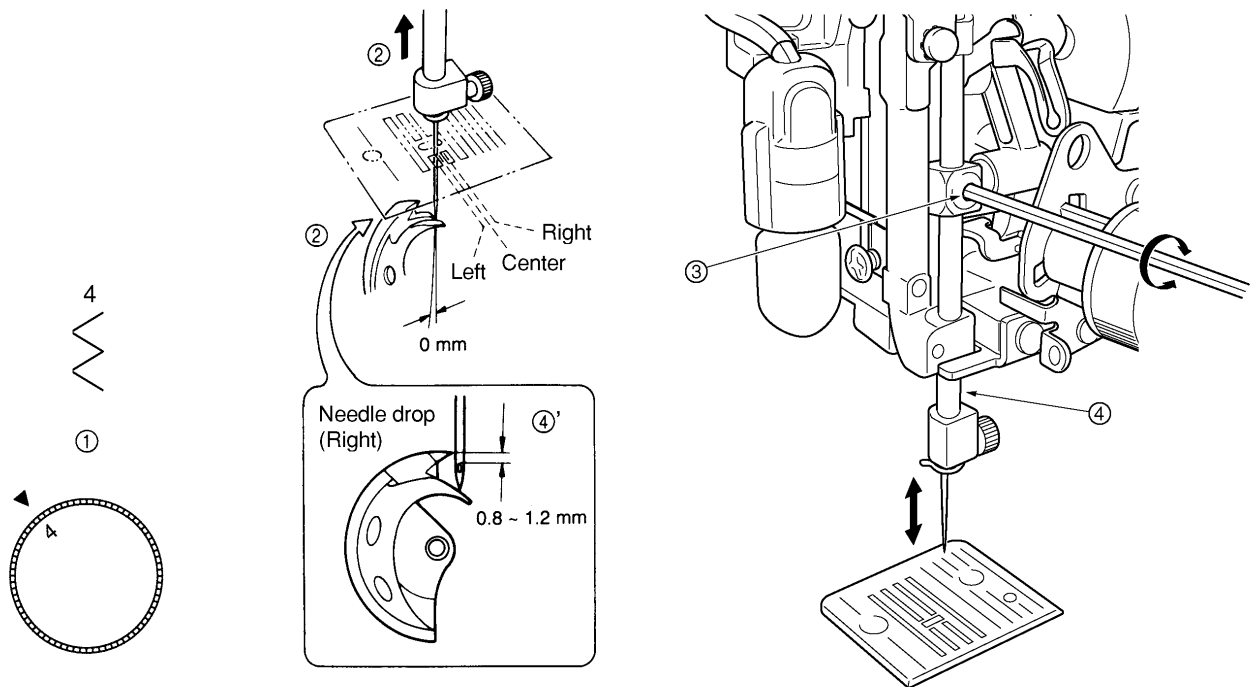
## Standard

- When the pattern selection dial is set at 4 (Zigzag) and the needle is raised 1.7 to 2.1 mm from its lowest position on the left side, the shuttle hook point should align with the side of the needle.

## Adjustment

1. Set the pattern selection dial to 4 (Zigzag), then lower the needle to its lowest position at the left side of the needle plate.
2. Loosen the set screw on the drive connecting rod.
3. Raise the needle between 1.7 and 2.1 mm and align the shuttle hook point with the side of the needle.
4. Tighten the set screw .


## Height of the needle bar



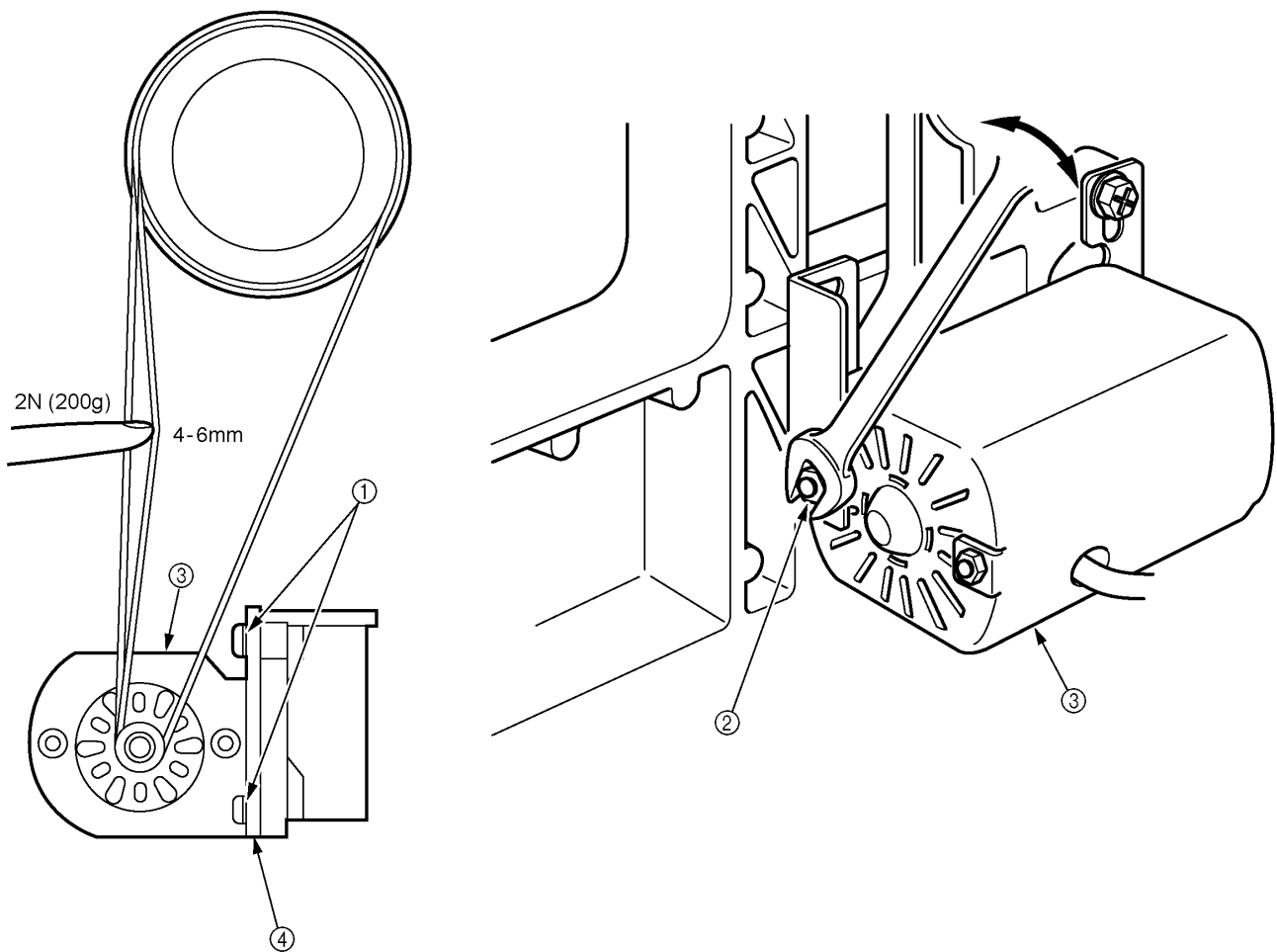
### Standard

- When the pattern selection dial is set at 4 (Zigzag), and the needle is on the right side and contacts the shuttle hook, the clearance between the top of the needle eye and shuttle hook point should be within 0.8 and 1.2 mm.

### Adjustment

1. Set the pattern selection dial to 4 (Zigzag), then lower the needle to its lowest position at the right side of the needle plate.
2. Turn the balance wheel until the needle contacts the shuttle hook.
3. Loosen the set screw on the needle bar.
4. Move the needle bar either up or down until the clearance between the top of the needle eye and the shuttle hook point is within 0.8 and 1.2 mm.
5. Tighten the set screw .

## Tension of the timing belt



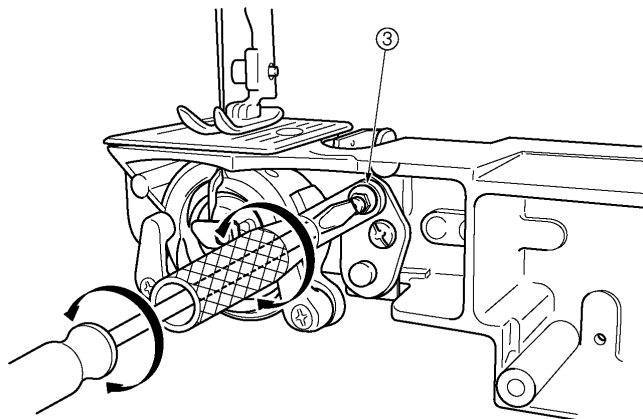
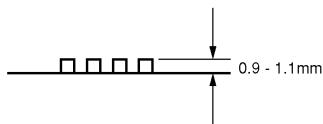
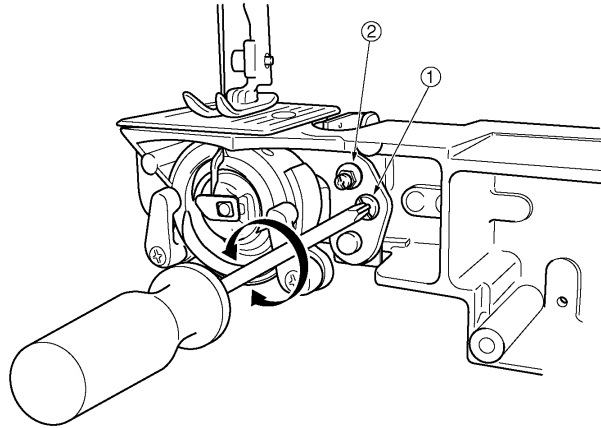
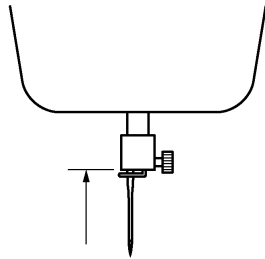
### Standard

- The belt should slacken approx. 4 - 6mm under a 2N (200g) load.

### Adjustment

1. Loosen the setscrews **1** on the motor holder **4** 220/240V.
2. Loosen the nuts **2** on the motor holder 120V.
3. Move the motor **3** to make adjustment.
4. Retighten the setscrews **1** and nuts **2**.

## Height of the feed dogs



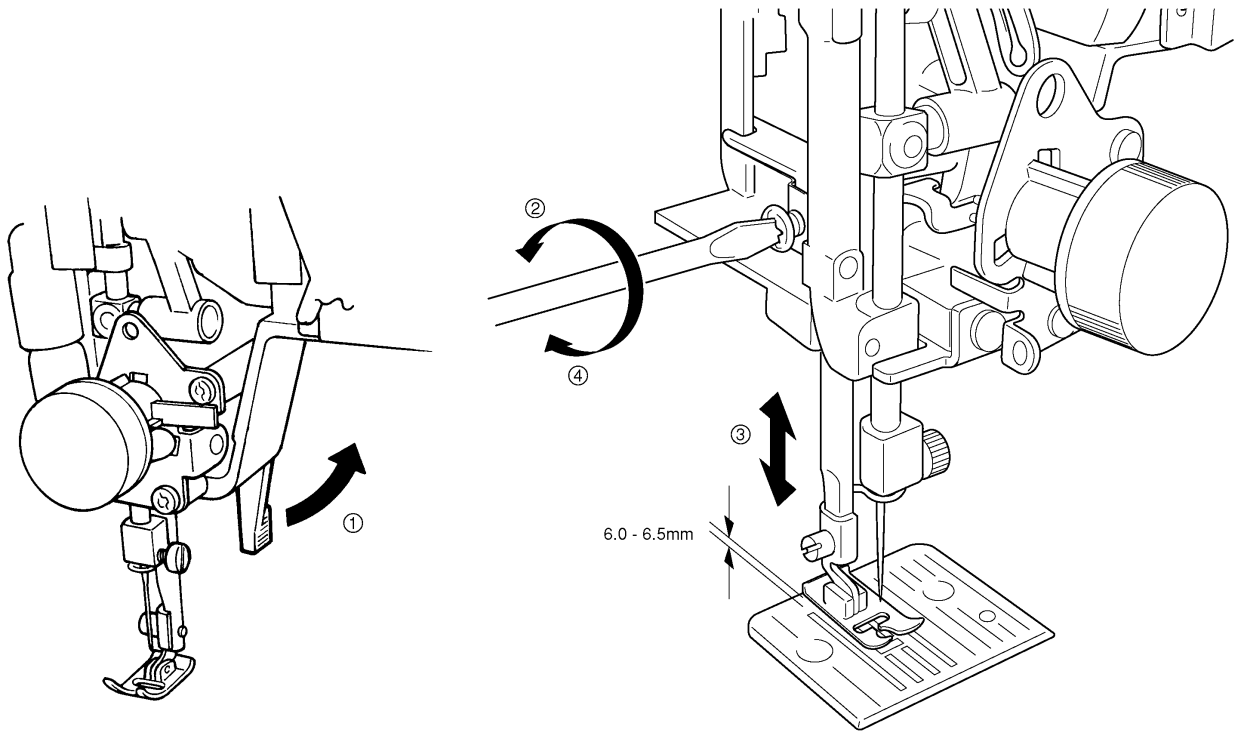
### Standard

- The feed dog teeth should be 0.9 - 1.1mm above the needle plate at the highest position.

### Adjustment

1. Loosen the setscrew ❶ on the vertical feed arm ❷.
2. Loosen the fixation screw of the eccentric nut ❸.
3. Turn the eccentric nut ❸ to make adjustment.
4. Retighten the fixation screw of the eccentric nut ❸.
5. Retighten the setscrew ❶.

## Height of the presser bar



### Standard

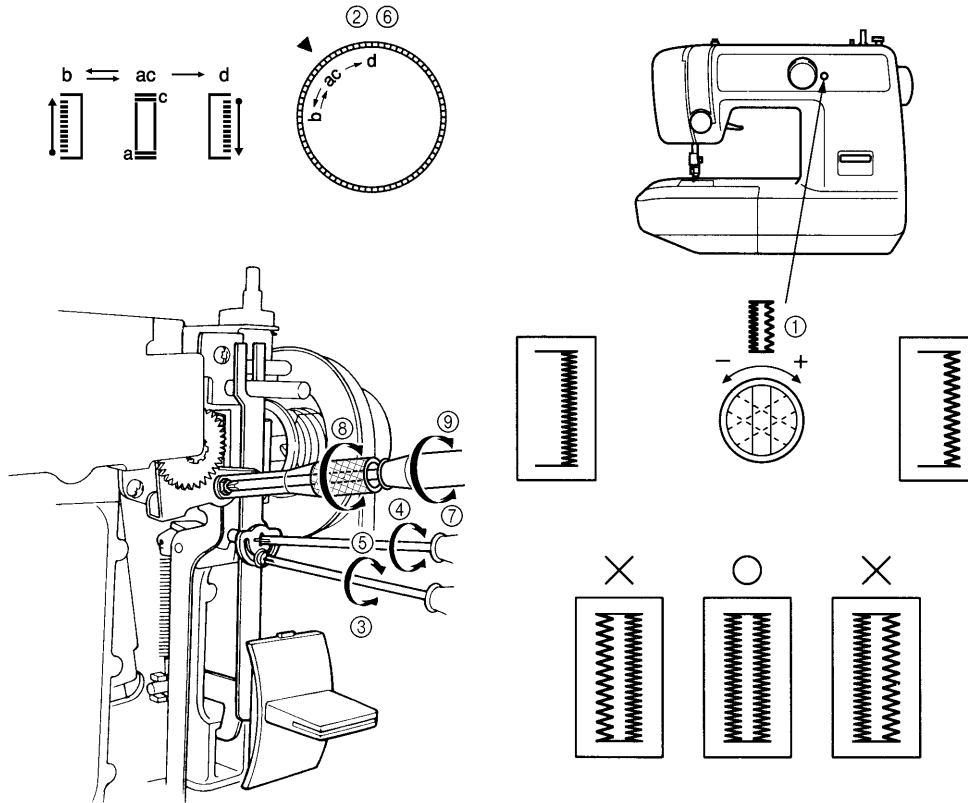
- The clearance between the presser foot and the needle plate should be between 6.0 and 6.5mm.

### Adjustment

1. Raise the presser foot.
2. Loosen the screw on the presser bar guide bracket.
3. Adjust the height of the presser bar.
4. Tighten the screw.

Note: Check that the presser foot and feed dogs are aligned.

## Adjusting the buttonhole's left backward stitching and right forward stitching



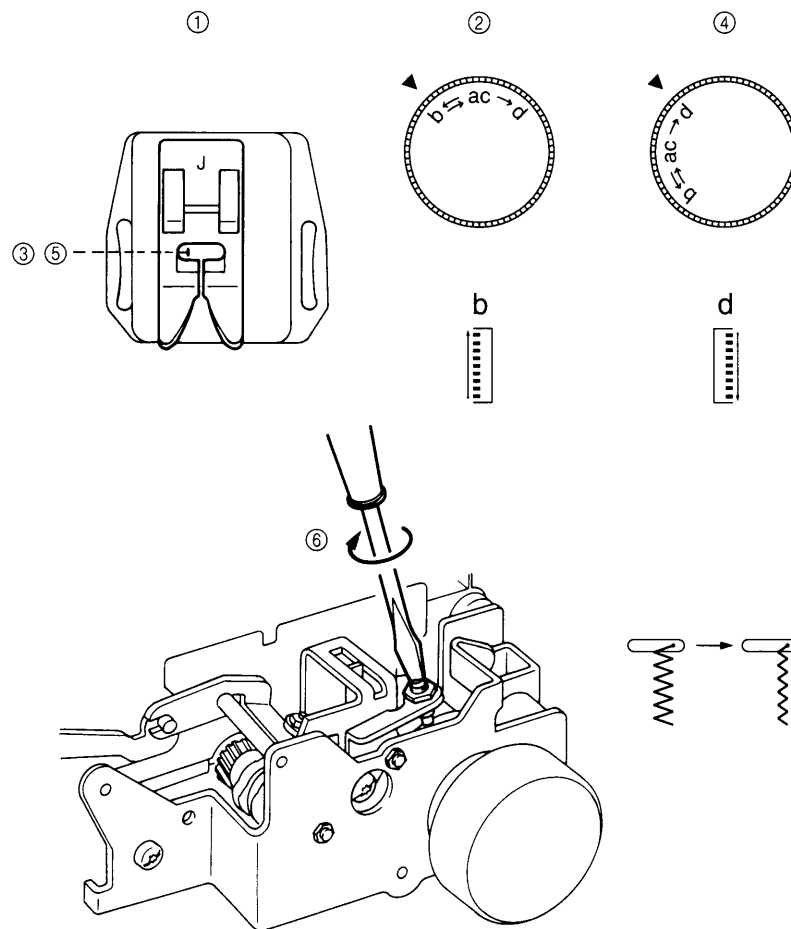
### Standard

- When a buttonhole is sewn using the  $b \rightleftarrows ac \rightarrow d$  setting on the pattern selection dial, the left backward stitching and right forward stitching should appear identical.

### Adjustment

1. Set the buttonhole adjustment dial to 0°.
2. Set the pattern selection dial to b and sew the left side of the buttonhole.
3. Loosen the screw on the reverse sewing regulator shaft.
4. Using a screwdriver, turn the reverse sewing regulator shaft to adjust the left backward stitching (b) until it feeds 35 to 45 stitches/20 mm.
5. Tighten the screw.
6. Set the pattern selection dial to d and sew the right side of the buttonhole.  
Caution: Satin stitch 4 will change according to the pitch length adjustment of the left backward stitching.
7. Loosen the fixation screw of the eccentric nut.
8. Use the nut to make adjustments so that the length of the right forward stitching is the same as the left backward stitching.
9. Tighten the screw.

## Adjusting the buttonhole's right forward stitching width



### Standard

- The width of the buttonhole's right forward stitching should appear identical to that of the left backward stitching. (The difference should be less than 0.2 mm.)

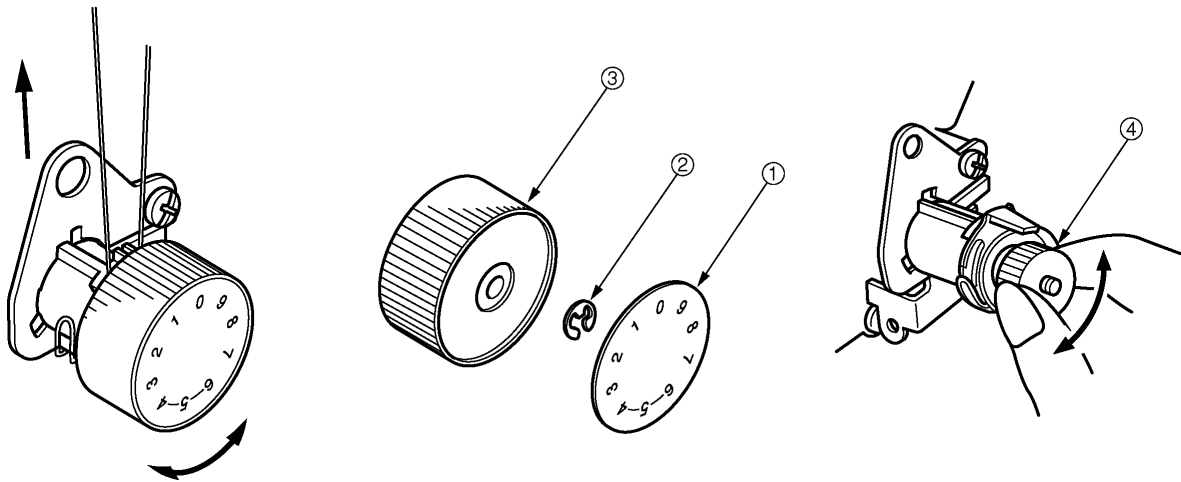
### Adjustment

1. Install the darning plate onto the needle plate and lower the presser foot onto a piece of paper.
2. Set the pattern selection dial to b.
3. Turn the balance wheel until the needle contacts the paper.
4. Set the pattern selection dial to d.
5. Turn the balance wheel until the needle contacts the paper.
6. Using a screwdriver, turn the adjusting screw to change the stitch width of the right side.

Note: Turn the adjusting screw to the right to make the stitch width of the right side more narrow.



## Upper tension control dial



### Standard

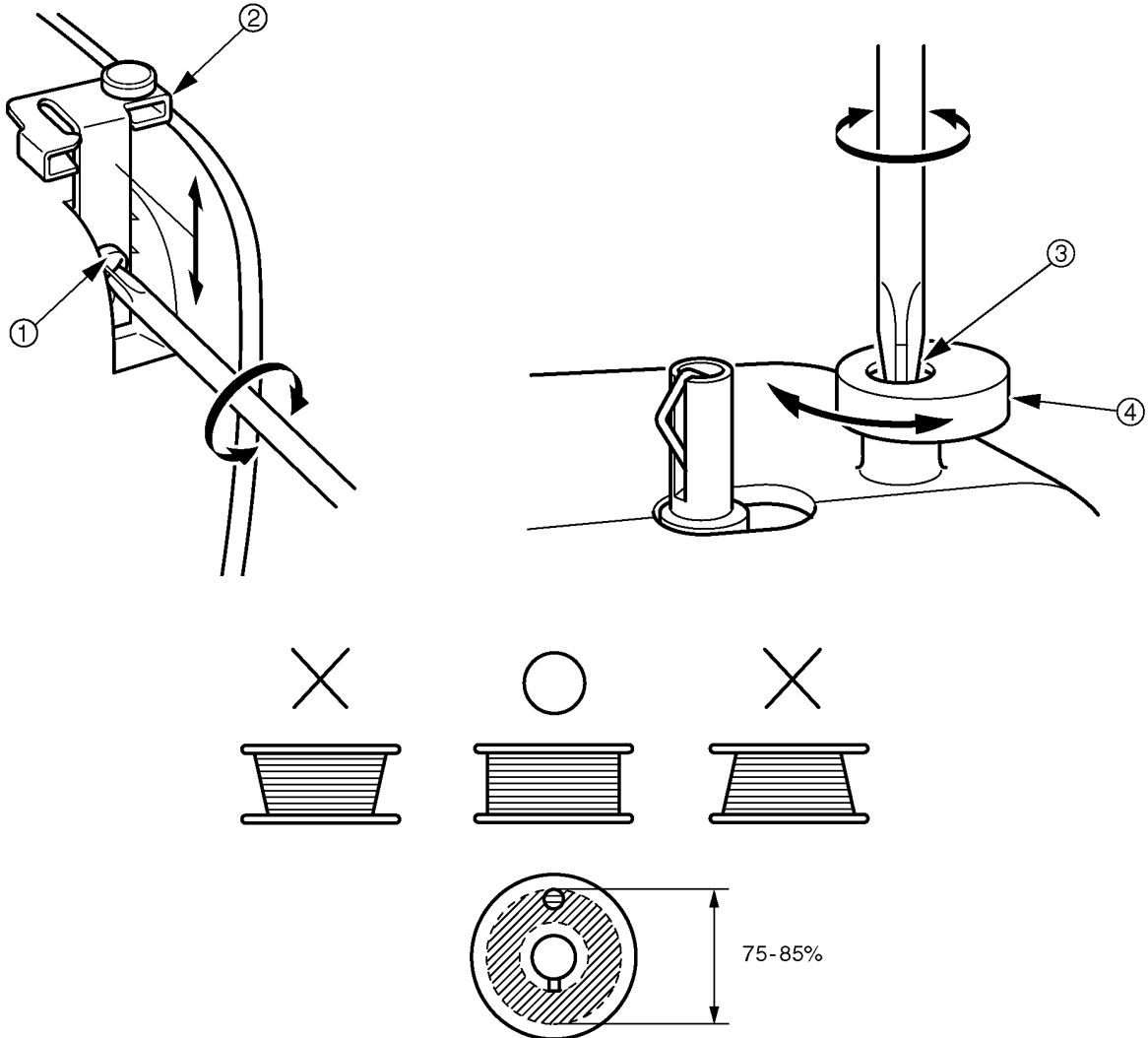
- A thread tension amount between 0.05 and 0.1N (5 and 10g) should be measured at dial position 0.

### Adjustment

1. Remove the tension dial sheet ❶ and the stopring ❷.
2. Remove the tension dial ❸.
3. Turn the adjusting nut ❹ left or right to make adjustment.
4. Remount the tension dial at zero position then the stopring and the tension dial sheet.

Note: Cotton thread #50 should be used when adjusting the tension.  
Do not include take up spring torque.

## Bobbin Winding



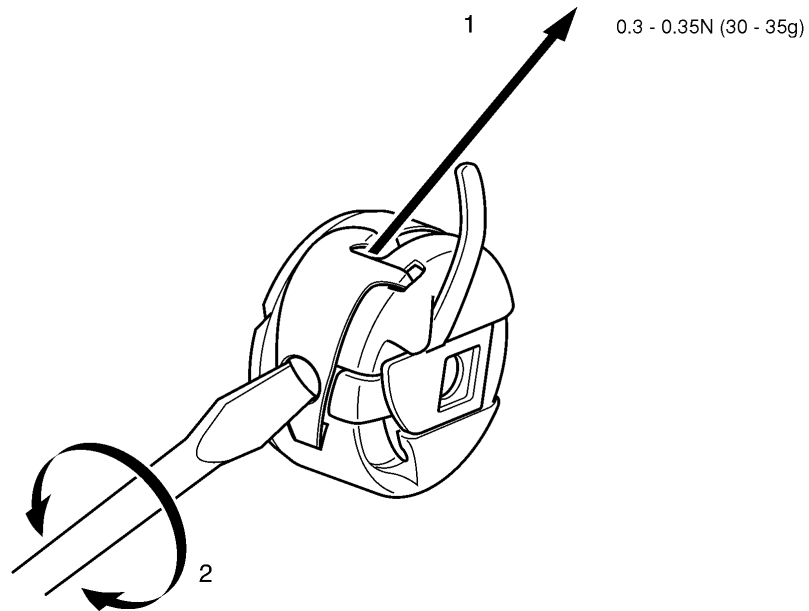
### Standard

- The bobbin should be wound evenly, up to 75 - 85% of the outer diameter of the bobbin.

### Adjustment

1. Loosen the set screw ① of the pretension ② slightly.
2. Shift the pretension ② up or down until even winding is achieved.
3. Retighten the set screw ①.
4. Loosen the set screw ③ of the bobbin presser ④.
5. Adjust the bobbin presser ④ until the correct amount of thread is wound.
6. Retighten the set screw ③.

## Adjustment of lower thread tension



### Standard

Lower thread tension: 0.3 - 0.35N (30 - 35g)

How to check the tension: Pull cotton thread #50 with tension gauge slowly.

1. Set cotton thread #50 in bobbin case and pull it with tension gauge.
2. Adjust the adjustment screw to tension 0.3 - 0.35N (30 - 35g)

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